

CLAIMS

1. A method for treating drinking water comprising:
 - a) providing raw water to a process tank;
 - b) adding an ion-exchange resin to the process tank to form a raw water/ion-exchange resin mixture; and
 - c) removing treated water from the process tank through a membrane filter.
2. The method of claim 1 wherein the ion-exchange resin is a magnetic ion-exchange resin.
3. The method of claim 1 further comprising agitating the raw water/ion-exchange resin mixture sufficiently to maintain the ion-exchange resin in suspension.
4. The method of claim 1 further comprising separating the ion-exchange resin from the raw water/ion-exchange resin mixture.
5. The method of claim 2 further comprising separating the ion-exchange resin from the raw water/ion-exchange resin mixture using a high gradient magnetic filter.
6. The method of claim 5 further comprising regenerating the ion-exchange resin.
7. The method of claim 6 further comprising providing the regenerated ion-exchange resin to the process tank.
8. The method of claim 6 wherein the regenerating step is performed in an external counter current column.
9. The method of claim 6 wherein the regenerating step is performed in the process tank by adding a saline solution to the process tank.

10. An apparatus for treating drinking water comprising:
a process tank for receiving raw water;
an ion-exchange resin supply operatively associated with the process tank to provide ion-exchange resin to raw water within the process tank; and
5 a membrane filter operatively associated with the process tank for separating particulate matter from treated water removed from the process tank through the membrane filter.
11. The apparatus of claim 10 further comprising a resin separator operatively
10 associated with the process tank for recovering ion-exchange resin from an ion-exchange resin/raw water mixture.
12. The apparatus of claim 11 wherein the ion-exchange resin is a magnetic
ion-exchange resin and the resin separator is a high gradient magnetic filter.
- 15 13. The apparatus of claim 11 further comprising a resin regenerator receiving removed ion-exchange resin from the separator.
14. The apparatus of claim 13 further comprising means for conveying
20 regenerated ion-exchange resin from the resin regenerator to the ion-exchange resin supply.
15. The apparatus of claim 13 wherein the resin regenerator is an external
counter current column using a saline solution to regenerate the ion-exchange resin.
- 25 16. The apparatus of claim 10 further comprising an aerator in the process tank for agitating an ion-exchange resin/raw water mixture in the process tank.